

AI Assignment 2

Name: Vishal Kumar

Roll No.: 2020154

Explanation:- I have implemented searching algorithms, namely, depth-first search and best-first search. I was not able to complete best-first search due to some errors. I made dataset/facts using the excel sheet provided by sir and some heuristics from the data as well. In this assignment, I have computed paths/routes from one city to another city using the distances provided.

Steps:

1. I have asked the user to first enter which algorithm he/she wants to use (1 for DFS, 2 for BFS). Then, the user enters the current city and the city to which he/she wants to go to.
2. If the user presses 1, then DFS starts working on the job. It searches for different possibilities and gives the result as soon as the destination is reached. It does not take into account whether the route provided is an optimal solution or not. It traverses into the neighboring cities one by one and goes into the depths until it reaches an end. If it finds the destination, it returns the result, otherwise, it backtracks and searches in other neighboring cities.
3. If the user presses 2, then BFS starts working. It is similar to DFS but it also uses breadth-first search. It had some preprocessed heuristics already provided for each city, which it uses to find the minimum cost path and the optimal solution to the given problem.

Screenshots:

```
/* Facts */

travel_dist(agartala,ahmedabad,3305).
travel_dist(agartala,bangalore,3824).
travel_dist(agartala,bhubaneshwar,2286).
travel_dist(agartala,bombay,3593).
travel_dist(agartala,calcutta,1863).
travel_dist(agartala,chandigarh,2998).
travel_dist(agartala,cochin,4304).
travel_dist(agartala,delhi,2708).
travel_dist(agartala,hyderabad,3330).
travel_dist(agartala,indore,2891).
travel_dist(agartala,jaipur,2801).
travel_dist(agartala,kanpur,2281).
travel_dist(agartala,lucknow,2252).
travel_dist(agartala,madras,3493).
travel_dist(agartala,pagpur,2696).

travel_dist(ahmedabad,agartala,3305).
travel_dist(bangalore,agartala,3824).
travel_dist(bhubaneshwar,agartala,2286).
travel_dist(bombay,agartala,3593).
travel_dist(calcutta,agartala,1863).
travel_dist(chandigarh,agartala,2998).
travel_dist(cochin,agartala,4304).
travel_dist(delhi,agartala,2708).
travel_dist(hyderabad,agartala,3330).
travel_dist(indore,agartala,2891).
travel_dist(jaipur,agartala,2801).
travel_dist(kanpur,agartala,2281).
travel_dist(lucknow,agartala,2252).
travel_dist(madras,agartala,3493).
travel_dist(pagpur,agartala,2696).
```

```
% c:/Users/viqha/Dropbox/My PC (LAPTOP-4G3OONOC)/Desktop/AI/ass2.pl compiled 0.08 sec, 1,879 clauses
?- go.
```

Which algorithm you want to choose? Depth-First (1) OR Best-First (2) :- 1.

Enter the current city :- |: delhi.

Enter the city you want to go to :- |: agra.

The route that you should take is :- [delhi,agartala,ahmedabad,agra]

true.

?-

```
/*underdetermined values of the distances. */
```

heuristic(agartala, agra, 2500).	heuristic(agra, allahabad, 2500).
heuristic(agartala, allahabad, 2000).	heuristic(allahabad, agartala, 2000).
heuristic(agartala, amritsar, 3000).	heuristic(amritsar, agartala, 3000).
heuristic(agartala, asansol, 2000).	heuristic(asansol, agartala, 2000).
heuristic(agartala, baroda, 3200).	heuristic(baroda, agartala, 3200).
heuristic(agartala, bhopal, 2800).	heuristic(bhopal, agartala, 2800).
heuristic(agartala, calicut, 4100).	heuristic(calicut, agartala, 4100).
heuristic(agartala, coimbatore, 3900).	heuristic(coimbatore, agartala, 3900).
heuristic(agartala, gwalior, 2500).	heuristic(gwalior, agartala, 2500).
heuristic(agartala, hubli, 3700).	heuristic(hubli, agartala, 3700).
heuristic(agartala, imphal, 3200).	heuristic(imphal, agartala, 3200).
heuristic(agartala, jabalpur, 2800).	heuristic(jabalpur, agartala, 2800).

?- go.

Which algorithm you want to choose? Depth-First (1) OR Best-First (2) :- 1.

Enter the current city :- |: bombay.

Enter the city you want to go to :- |: baroda.

The route that you should take is :- [bombay,agartala,ahmedabad,agra,bangalore,allahabad,bhubaneshwar,amritsar,calcutta,asansol,chandigarh,baroda]

true.

?-